Distributed Virtual SAN Infrastructure

Console host
Management console — 14
— 10

11

IP SAN unit (spare) — 13
Service modules

IP SAN unit   4
Service modules

IP SAN unit
Service modules

IP SAN unit
Service modules

Fibre channel IP
SAN unit
Service modules — 6

Fibre Channel
to IP Gateway
5

network infrastructure,   2

Network infrastructure,

Distribute Control
Management Station
control mgmt
modules
7
Console support
software modules
8
Web server module
15
mgmt console — 10

1

Host (1)
service
modules

Host (2)
service
modules

Host (n)
service
modules

9

Spare host
Service
modules

3

12

Fig. 1

The Actual Components of Distributed Virtual SAN

11

IP SAN Unit

service modules

4

IP SAN Unit

service module

IP SAN Unit

service module

Fibre Channel SAN unit

service module

6

Fibre Channel
to IP Gateway

5

Net infrastructure

2

management
console

14

10

**Distribute Control
Management
Station**

3

Control Mgmt
software modules

7

Console support
software

8

Mgmt console
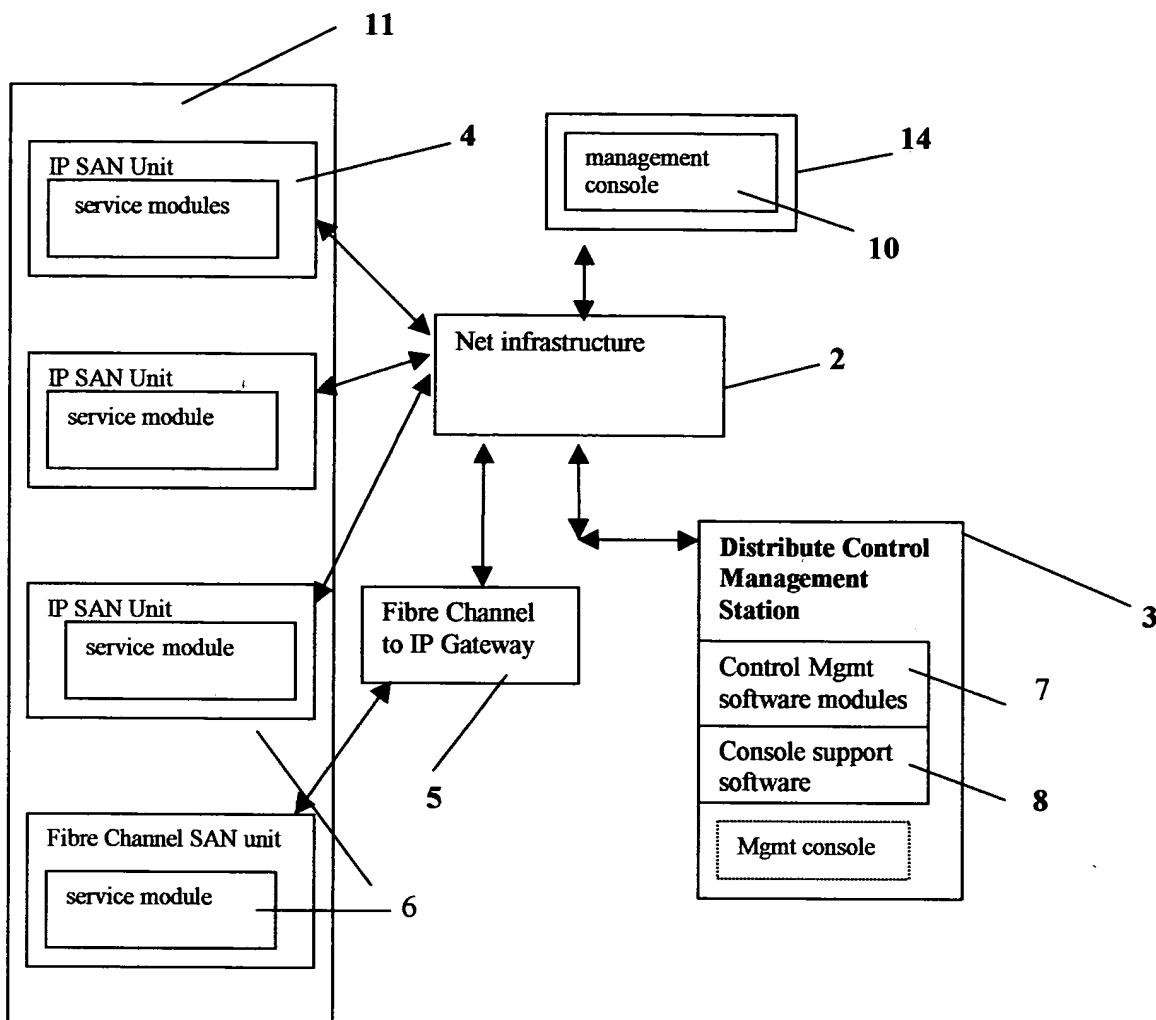
Fig. 2

Virtual SAN Storage Pool Automatic Configuration Protocol

IP SAN Unit (4)   distribute Control Management Station (3)

Send "Unit (n) Start Up"

                                                           Receive "Unit (n) Start Up"

Receive "need unit (n) storage info"

                                                           Send "need unit(n) storage info"

Send "unit (n) storage info"

                                                           Receive "unit (n) storage info"

IP SAN Unit   distribute Control Management Station

    Send "unit (n) shutdown"

                                                           Receive "unit (n) shutdown"
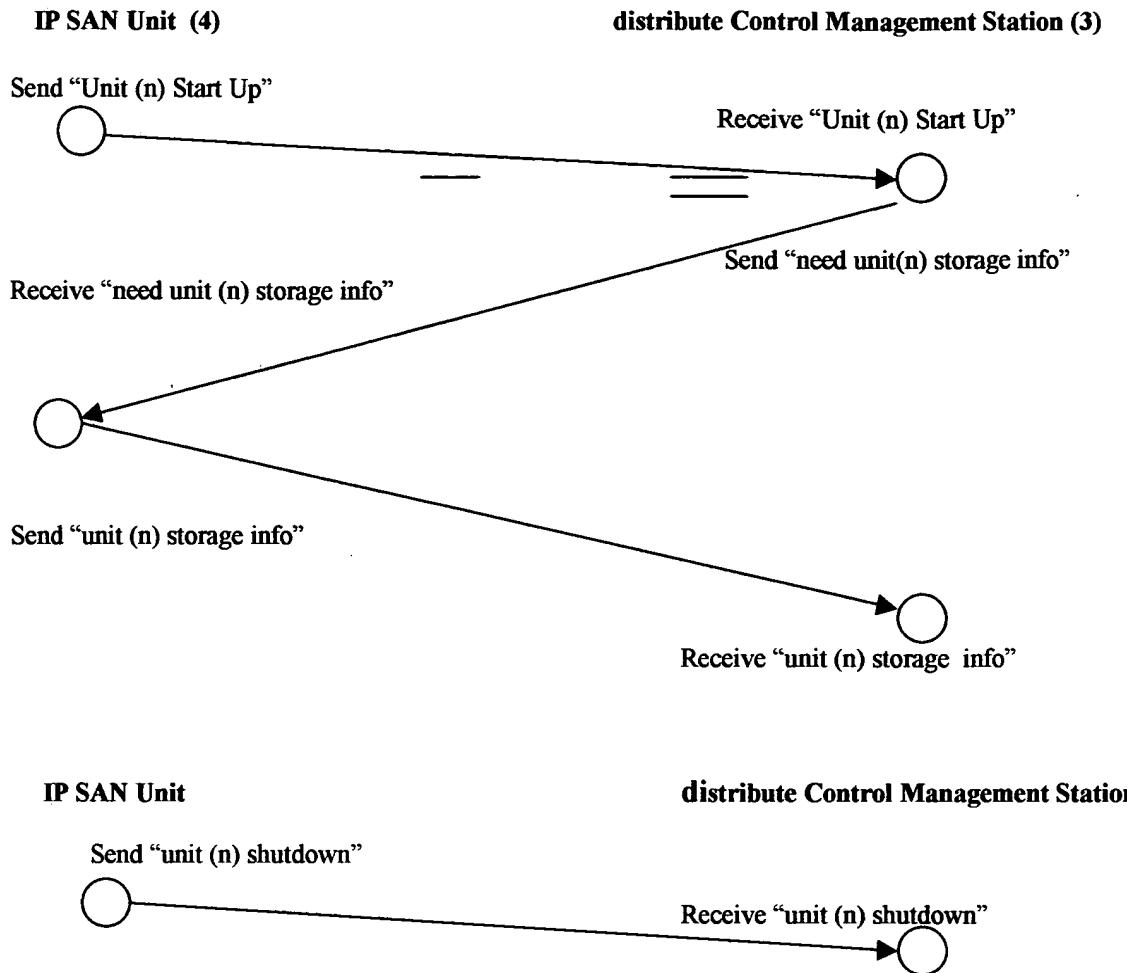
Fig. 3

The UDP packet format used by "Virtual SAN Auto Configuration Protocol"

| |
|---|
| **Source IP address** |
| **Destination IP address** |
| **Source port** |
| **Destination port** |
| **Message Type** |
| **Data Length** |
| **Data Area** |
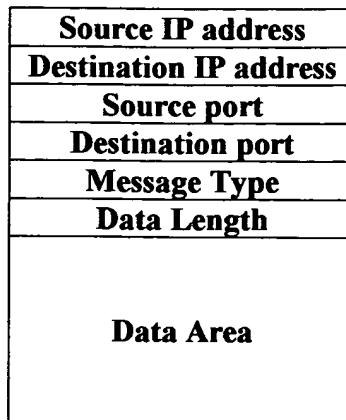
Fig. 4

**Example of Storage Volume Information of an IP SAN Unit**

IP SAN Unit

| **Volume 1**			
P1	P2	P3	P3
Volume 2			
Volume 3			
Volume 4			
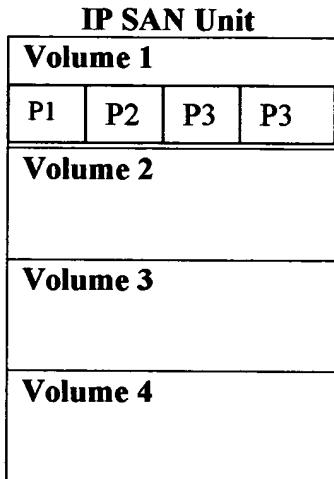
**Note: Each volume may further be partitioned into small chunk of
partition.**

Fig. 5

A Hypothetical Example of Storage Volume Requests and Assignments

IP SAN Unit (1)	Volume 1 50GB
	Volume 2 50GB
	Volume 3 60GB
	Volume 4 40GB

IP SAN Unit (2)	Volume 1 100GB
	Volume 2 100GB
	Volume 3 100GB

| IP SAN Unit (M) | Volume 1 200 GB |
| | Volume 2 80 GB |

Host (1)

Host (2)
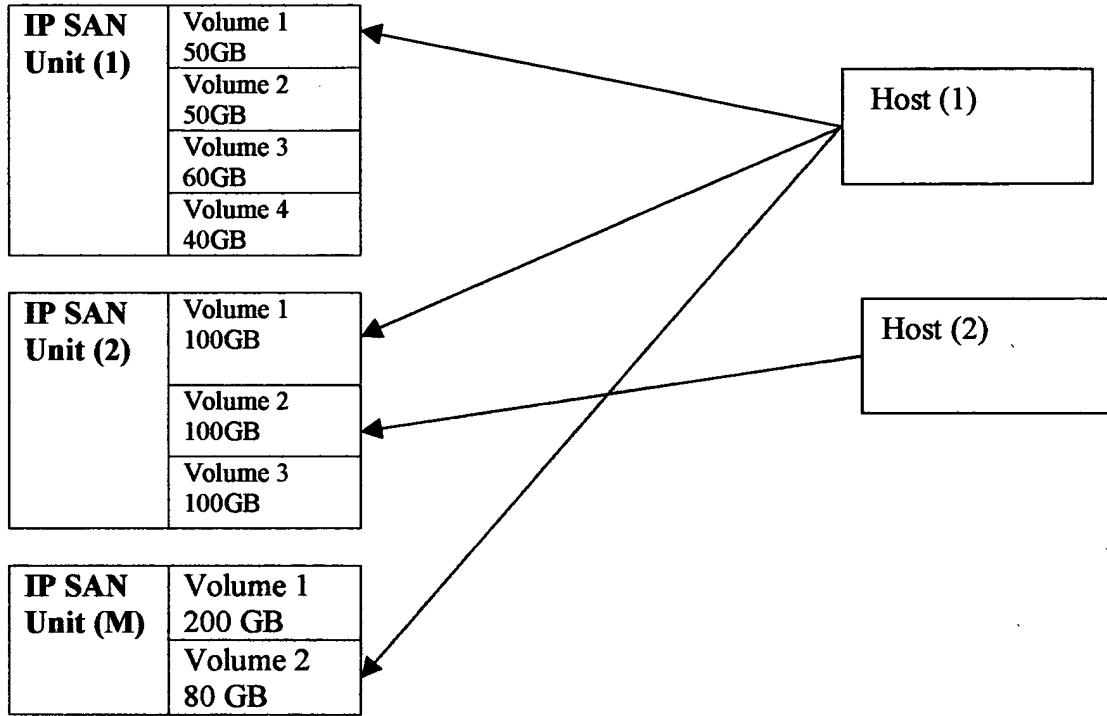
Fig. 6

Direct Attached Storage System:
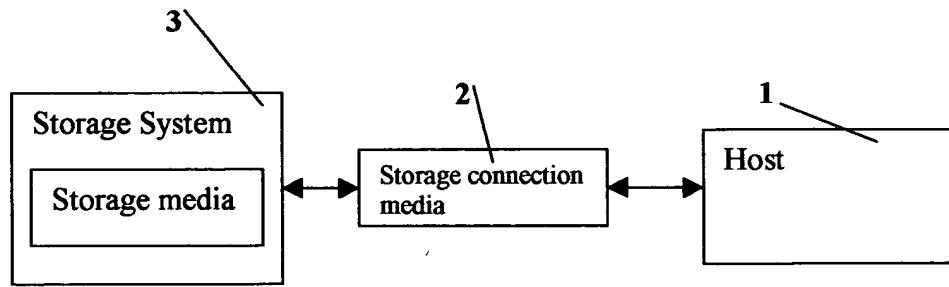
Fig. 7

In-Band Accessed Virtual SAN
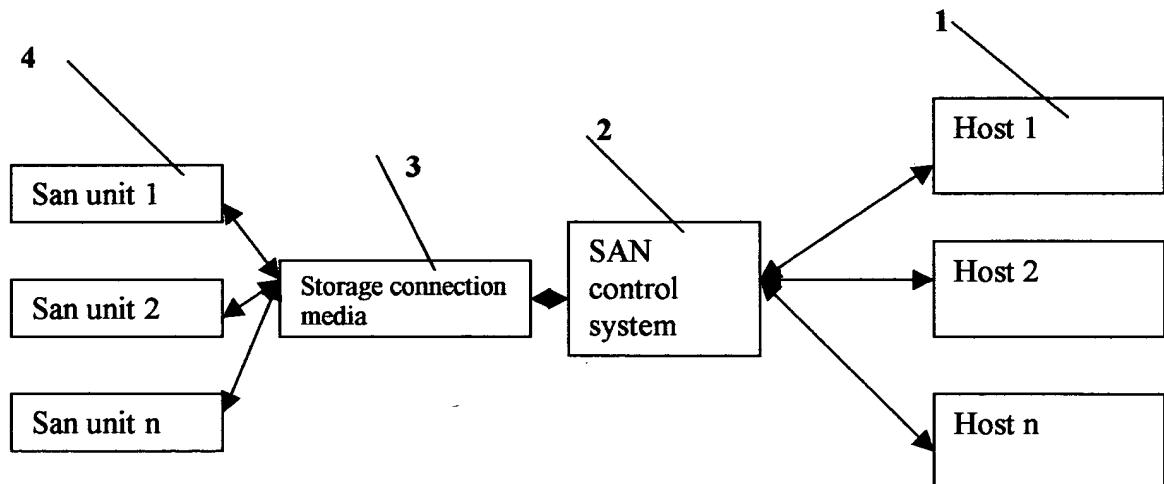
Fig. 8

Central Controlled Distributed Scalable Virtual Machine Infrastructure
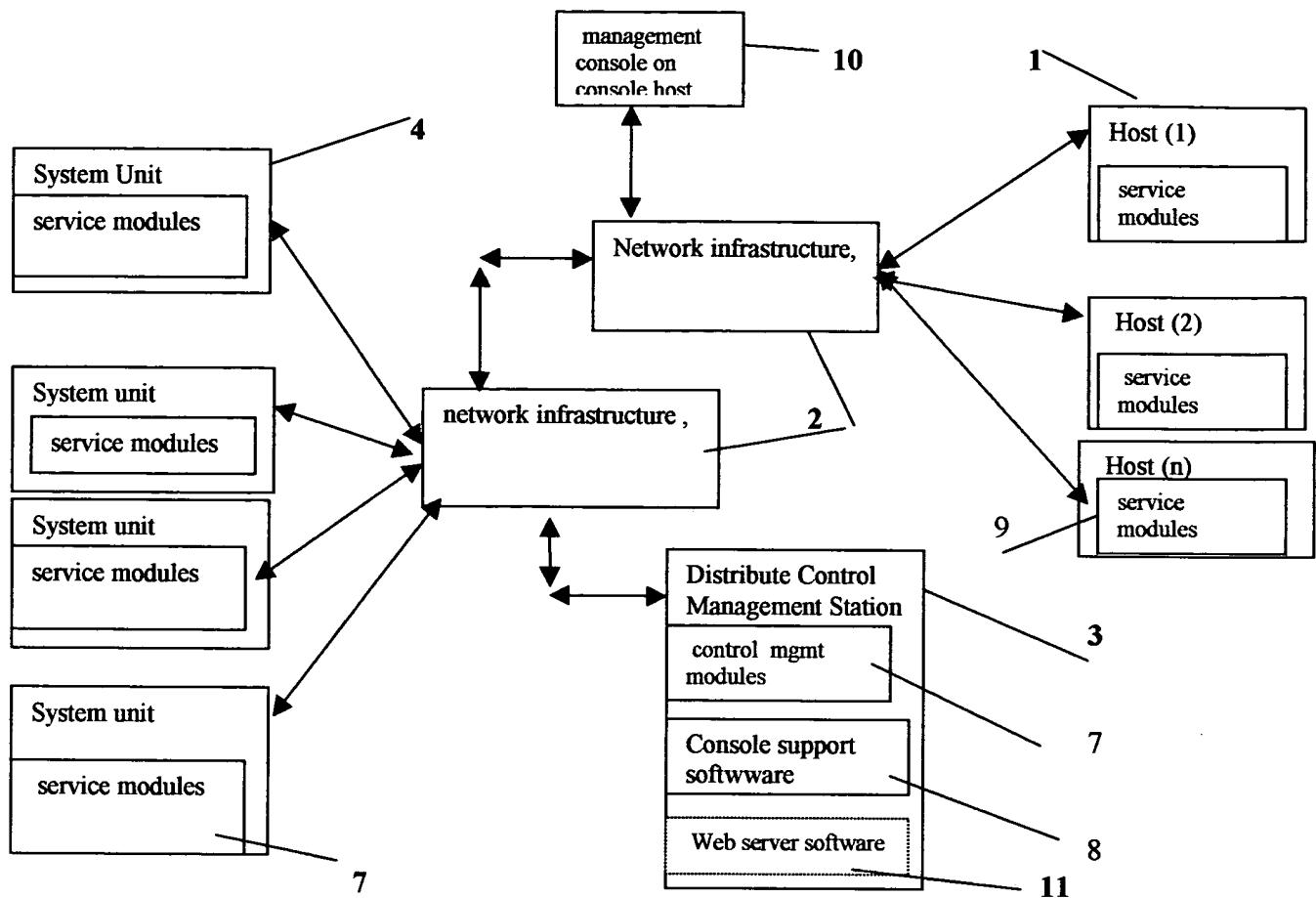
Fig. 9

Recovery Scheme of the Distributed Virtual SAN Infrastructure

IP SAN unit 1

IP SAN unit 2

IP SAN unit 3
(spare)

3

IP SAN unit 4

IP SAN unit 5

Host 1

Host 2 (spare)

Host 3

1

Network Infrastructure 2

Fig. 10